

Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

- 1). (Currently Amended) A method, comprising:

 ~~using hardware and software to perform~~ performing repeatedly ~~continuous~~ edge profiling
on a program;

 detecting profile phase transitions ~~continuously~~ repeatedly; and

 optimizing the program based upon the profile phase transitions and edge profile.
- 2). (Currently Amended) The method of claim 1, wherein performing repeatedly edge profiling ~~using hardware and software~~ comprises:

 using software to insert edge profiling instructions and arrange profile data;

 executing the program; and

 using hardware to update profile phase transitions, and signal phase transitions.
- 3). (Original) The method of claim 2, wherein using software to insert profiling instructions comprises modifying branch instructions to assign an identifier to one or more profiled edges, and to assign a value to an edge selection field.
- 4). (Currently Amended) The method of claim 3, wherein using software to insert profiling instructions further comprises inserting a profile identifier instruction when the profiled edge ~~does not have~~ lacks at least one of a branch instruction; an initialize profile instruction; and a set offset instruction.
- 5). (Original) The method of claim 2, wherein using hardware comprises translating edge profiling instructions into profile update operations.

- 6). (Original) The method of claim 4, further comprising:
loading a profile information register with a base address, an offset value, a trigger-counter, and a flag.
- 7). (Original) The method of claim 5, further comprising:
intercepting with hardware the profiling instructions;
generating a profile update operation; and
updating profile counters.
- 8). (Currently Amended) The method of claim 1, wherein detecting profile phase transitions ~~continuously~~ repeatedly, comprises generating an interrupt signal by the hardware when the profile phase transition occurs.
- 9). (Original) The method of claim 8, further comprising:
determining if a program edge is hot, comprising
determining if the profiling instruction is executed, and
updating profiling counters associated with the profiling instruction;
determining if a cold edge becomes a hot edge, comprising
incrementing and decrementing trigger counters, and
detecting if trigger counters overflow and underflow;
preventing a false phase transition by detecting trigger counters underflow.
- 10). (Currently Amended) A system, comprising:
a processor pipeline ~~configured~~ to generate a profile ID for each profiled edge, and generate
profile update operations;

a profile information register coupled to the processor pipeline;
a first logic device ~~configured~~ to accept the profile update operations and profile ID to generate a memory buffer address;
a profile cache ~~for accepting~~ to accept the buffer address connected to the first logic device; and
a second logic device ~~connected~~ coupled to the profile cache configured to generate a phase transition interrupt signal,
wherein the system performs edge profiling on a program, detects profile phase transitions ~~continuously~~ repeatedly, and optimizes the program based upon the profile phase transitions.

- 11). (Original) The system of claim 10, wherein the processor pipeline
executes the program;
intercepts profiling instructions and updates profile counters; and
updates profile phase transition trigger counters, and
signals phase transitions.
- 12). (Original) The system of claim 11, wherein the software inserts edge profiling
instructions for modifying branch instructions to assign an identifier to one or more profiled
edges, and to assign a value to an edge selection field.
- 13). (Original) The system of claim 12, wherein the software while inserting edge profiling
instructions, also inserts a profile identifier instruction when the profiled edge does not have a
branch instruction; an initialize profile instruction; and a set offset instruction.
- 14). (Original) The system of claim 11, wherein the processor translates edge profiling
instructions into profile update operations.

- 15). (Original) The system of claim 13, wherein the processor pipeline loads a profile information register with a base address, an offset value, a trigger-counter, and a flag.
- 16). (Original) The system of claim 14, wherein the processor pipeline:
intercepts the profiling instructions;
generates a profile update operation; and
updates profile counters.
- 17). (Original) The system of claim 10, wherein the logic device generates an interrupt signal when the profile phase transition occurs.
- 18). (Currently Amended) The system of claim 17, wherein the processor:
determines if a program edge is hot, by determining if the profiling instruction is executed,
updating profile counters associated with the profiling instruction, and determining if the trigger counters overflow;
determines if a cold edge becomes a hot edge, comprising
incrementing and decrementing trigger counters, ~~and~~
detecting if trigger counters overflow and underflow;
~~preventing~~ prevents a false phase transition by detecting trigger counters underflow.
- 19). (Currently Amended) A computer-readable medium having stored thereon a plurality of instructions, said plurality of instructions when executed by a computer, cause said computer to perform:
~~using hardware and software to perform continuous~~ performing repeatedly edge profiling
on a program;

detecting profile phase transitions ~~continuously~~ repeatedly; and
optimizing the program based upon the profile phase transitions and edge profile.

20). (Original) The computer-readable medium of claim 19 having stored thereon additional instructions, said additional instructions when executed by a computer for using hardware and software to perform edge profiling on a program, cause said computer to further perform:

using software to insert edge profiling instructions and arrange profile data;
executing the program; and
using hardware to update profile phase transitions, and signal phase transitions.

21). (Original) The computer-readable medium of claim 20 having stored thereon additional instructions, said additional instructions when executed by a computer for using software to insert edge profiling instructions, cause said computer to further perform:

modifying branch instructions to assign an identifier to one or more profiled
edges, and to assign a value to an edge selection field.

22). (Original) The computer-readable medium of claim 21 having stored thereon additional instructions, said additional instructions when executed by a computer for using software to insert edge profiling instructions, cause said computer to further perform:

inserting a profile identifier instruction; when the profiled edge does not have a
branch instruction, an initialize profile instruction, and a set offset
instruction.

23). (Original) The computer-readable medium of claim 20, having stored thereon additional instructions, said additional instructions when executed by a computer for using hardware, cause

said computer to further perform translating edge profiling instructions into profile update operations.

24). (Original) The computer-readable medium of claim 22 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform:

loading a profile information register with a base address, an offset value, a trigger-counter, and a flag.

25). (Original) The computer-readable medium of claim 23 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform:

intercepting with the hardware the profiling instructions;
generating a profile update operation; and
updating profile counters.

26). (Currently Amended) The computer-readable medium of claim 19 having stored thereon additional instructions, said additional instructions when executed by a computer for detecting profile phase transitions ~~continuously~~ repeatedly, cause said computer to further perform:

generating an interrupt signal by the hardware when the profile phase transition occurs.

27). (Currently Amended) The computer-readable medium of claim 26 having stored thereon additional instructions, said additional instructions when executed by a computer for detecting profile phase transitions ~~continuously~~ repeatedly, cause said computer to further perform:

determining if a program edge is hot, comprising
determining if the profiling instruction is executed, and

updating profile counters associated with the profiling instruction;
determining if a cold edge becomes a hot edge, comprising
incrementing or decrementing trigger counters, and
detecting if trigger counters overflow and underflow; and
preventing a false phase transition by detecting trigger counters underflow.
